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PATENT APPLICATION  
09/910,587

1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Randal G. Martin, et al.  
Serial No.: 09/910,587  
Filing Date: July 20, 2001  
Confirmation No.: 1407  
Group Art Unit: 2616  
Examiner: Feben M. Haile  
Title: SYSTEM AND METHOD FOR ORDERING  
OF DATA TRANSFERRED OVER  
MULTIPLE CHANNELS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

APPEAL BRIEF

Applicant has appealed to the Board of Patent Appeals and Interferences from the final decision of the Examiner mailed October 9, 2007 and the Advisory Action issued January 9, 2008 finally rejecting Claims 1-18. In response to the Notice of Panel Decision from Pre-Appeal Brief Review issued April 7, 2008, Applicant respectfully submits herewith their brief on appeal.

REAL PARTY IN INTEREST

The present application was assigned to Silicon Graphics, Inc., a Delaware corporation, as indicated by an assignment from the inventors recorded on November 5, 2001 in the Assignment Records of the United States Patent and Trademark Office at Reel 012321, Frames 0247-0253.

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

STATUS OF CLAIMS

Claims 1-18 stand rejected pursuant to a Final Action issued October 9, 2007. Claims 1-18 are all presented for appeal.

STATUS OF AMENDMENTS

A Response to Examiner's Action was filed on May 9, 2005 in response to an Official Action issued February 9, 2005. Claims 1, 6, 11, and 15 were amended. A Response to Examiner's Final Action was filed on September 19, 2005 in response to a Final Action issued July 18, 2005. No further amendments were made to the claims. A Notice of Appeal and Request for Pre-Appeal Brief Review were filed on November 18, 2005 in response to an Advisory Action issued October 3, 2005. A Notice of Panel Decision from Pre-Appeal Brief Review was issued on January 5, 2006 reopening prosecution. A Response to Examiner's Action was filed on April 11, 2006 in response to an Office Action issued January 12, 2006. Claims 1-3, 6, 11, and 15 were amended. A Response to Examiner's Final Action was filed on August 21, 2006 in response to a Final Action issued June 21, 2006. Claims 1 and 6 were amended. A Request for Continued Examination was filed on September 20, 2006 in response to an Advisory Action issued September 7, 2006. A Response to Examiner's Action was filed on January 10, 2007 in response to an Office Action issued October 10, 2006. Claims 1, 6, 11, and 15 were amended. A Response to Examiner's Action was filed on July 20, 2007 in response to an Office Action issued April 20, 2007. No further amendments were made to the claims. A Response to Examiner's Final Action was filed on December 10, 2007 in response to a Final Action issued October 9, 2007. No further amendments were made to the claims. A Notice of Appeal and Request for Pre-Appeal Brief Review were filed on February 11, 2008 in response to an Advisory Action issued January 9, 2008. A Notice of Panel Decision from Pre-Appeal Brief Review was issued on April 7, 2008 indicating that an appeal is to proceed to the Board of Patent Appeals and Interferences.

SUMMARY OF CLAIMED SUBJECT MATTER

With respect to Independent Claim 1, there is provided a method for ordering data transferred over multiple channels. (See FIGURE 2 and page 6, lines 9-10). The method includes generating a first data packet in a particular packet flow in response to a first flow control credit. (See FIGURE 2 and page 6, lines 13-19, and page 7, lines 3-16). A first sequence number is generated and the first sequence number is inserted into the first data packet. (See FIGURE 2 and page 6, lines 20-22). A first one of a plurality of channels 18 is selected to transfer the first data packet according to channel capacities of the plurality of channels 18. (See FIGURE 2 and page 5, lines 22-26). The first data packet is transferred over the selected first one of the plurality of channels 18. (See FIGURE 2 and page 6, lines 24-27). A second data packet is generated in the particular packet flow in response to a second flow control credit. (See FIGURE 2 and page 6, lines 13-19, and page 7, lines 3-16). A second sequence number is generated and the second sequence number is inserted into the second data packet. (See FIGURE 2 and page 6, lines 20-22). A second one of a plurality of channels 18 is selected to transfer the second data packet according to channel capacities of the plurality of channels 18. (See FIGURE 2 and page 5, lines 22-26). The second data packet of the particular packet flow is transferred over the selected second one of the plurality of channels 18. (See FIGURE 2 and page 6, lines 24-27). The second one of the plurality of channels 18 is different than the first one of the plurality of channels 18 as a result of varying channel capacities among the plurality of channels 18. (See FIGURE 2 and page 5, line 30, to page 6, line 5).

With respect to Independent Claim 6, there is provided a system 12 for ordering data transferred over multiple channels 18. The system 12 includes a sequence number unit 24 operable to generate a first sequence number. (See FIGURE 2 and page 6, lines 20-24). A request channel controller 22 receives a first data packet of a particular packet flow in response to a first flow control credit. (See FIGURE 2 and page 7, lines 11-16). The request channel controller 22 inserts the first sequence number into the first data packet. (See FIGURE 2 and page 6, lines 20-22). The request channel controller 22 selects a first one of a plurality of request channels 18 according to channel capacities of the plurality of request channels 18. (See FIGURE 2 and page 5, lines 22-26). The request channel controller 22 transfers the first data packet over the selected first one of the plurality of request channels 18. (See FIGURE 2 and page 6, lines 24-27). The request channel controller 22 receives a second data packet in the particular packet flow in response to a second flow control credit. (See FIGURE 2 and page 7, lines 11-16). The request channel controller 22 inserts a second sequence number into the second data packet. (See FIGURE 2 and page 6, lines 20-22). The request channel controller 22 selects a second one of the plurality of request channels according to channel capacities of the plurality of request channels. (See FIGURE 2 and page 5, lines 22-26). The request channel controller 22 transfers the second data packet over the selected second one of the plurality of request channels 18. (See FIGURE 2 and page 6, lines 24-27). The second one of the plurality of channels 18 being different than the first one of the plurality of channels 18 as a result of varying channel capacities among the plurality of channels 18. (See FIGURE 2 and page 5, line 30, to page 6, line 5).

With respect to Independent Claim 11, there is provided a method for ordering data transferred over multiple channels 18. (See FIGURE 4 and page 9, lines 10-11). The method includes receiving a plurality of data packets of a particular packet flow over different ones of a plurality of channels 18. (See FIGURE 4 and page 9, lines 16-19). Each data packet includes a sequence number and the plurality of packets being received in a non-sequential order. (See FIGURE 4 and page 6, lines 1-8). Each of the plurality of data packets is stored in a buffer according to its sequence number. (See FIGURE 4 and page 9, lines 19-26). The plurality of data packets are read in sequential order from the buffer according to the sequence numbers. (See FIGURE 4 and page 9, line 28, to page 10, line 9). A flow control credit is generated in response to each of the plurality of data packets being read from the buffer 53. (See FIGURE 4 and page 10, lines 9-13).

With respect to Independent Claim 15, there is provided a system 18 for ordering data transferred over multiple channels. (See FIGURE 4 and page 9, lines 10-11). The system 18 includes a write port controller 52 operable to receive a plurality of data packets of a particular packet flow in a non-sequential order over different ones of a plurality of channels 14 where each data packet includes a sequence number. (See FIGURE 4 and page 9, lines 19-26). A re-order buffer 53 stores the plurality of data packets and the write port controller 52 places each data packet into the re-order buffer 53 in response to its sequence number. (See FIGURE 4 and page 9, lines 19-26). A valid bit unit 54 generates a valid bit for each portion of the re-order buffer 53. (See FIGURE 4 and page 9, lines 27-32). The valid bit unit 54 sets a valid bit for a corresponding portion of the re-order buffer 53 in response to a data packet being stored therein. (See FIGURE 4

and page 9, lines 27-32). A read port controller 56 provides data packets in a sequential order in response to a valid bit being set. (See FIGURE 4 and page 9, line 30, to page 10, line 4).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Did the Examiner err in concluding that Claims 1-18 stand rejected under 35. U.S.C. §112, first paragraph, as containing subject matter not described in the specification?

2. Did the Examiner err in concluding that Claims 1-14 were obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,222,061 issued to Doshi, et al. in view of U.S. Patent No. 6,594,701 issued to Forin and further in view of U.S. patent No. 6,810,428 issued to Larsen?

3. Did the Examiner err in concluding that Claims 15-18 were obvious under 35 U.S.C. §103(a) over U.S. Patent No. 5,222,061 issued to Doshi, et al. in view of U.S. Patent No. 6,944,173 issued to Jones, et al.?



ARGUMENT

1. Claims 1-18 stand rejected under 35. U.S.C. §112, first paragraph, as containing subject matter not described in the specification. The Examiner indicates that there is no support in the specification for the feature of generating data packets in a particular packet flow. Support for this feature can be found at page at page 6, line 32, to page 7, line 2, of Applicant's specification. Specifically, Applicant's specification discloses that data received from a data source is placed into packets and each packet is given a sequence number. (See page 6, lines 13-24, of Applicant's specification). Thus, a flow of packets can be re-ordered at a destination using the sequence numbers. For each block of data to be transferred from the data source, the sequence numbers can be reset and thus separate packet flows are generated for each block of data. Different packet flows for each block of data are generated in response to resetting the sequence numbers and can be re-ordered at the destination without confusing packets from one block of data with packets from another block of data despite the re-use of sequence numbers. It is clear from the specification that each generated packet is provided with a sequence number and that each generated packet is part of a block of data. Packets associated with a block of data are transported over a multiple number of channels. See page 5, line 30, to page 6, line 8, and page 6, line 20, to page 7, line 2, of Applicant's specification. As a result, each block of data is provided in a separate packet flow through the resetting of the sequence numbers. For a new block of data, the sequence numbers are reset and a new packet flow associated with the new block of data can have its packets transported over a number of channels. Accordingly, there is ample support in Applicant's

ATTORNEY DOCKET NO.  
062986.0214  
(1151.00)

PATENT APPLICATION  
09/910,587

10

specification for the limitation 'data packets in a particular packet flow' as provided in the claimed invention. Therefore, Applicant respectfully submits that Claims 1-18 are in accordance with 35 U.S.C. §112, first paragraph.

2. Claims 1-14 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,222,061 issued to Doshi, et al. in view of U.S. Patent No. 6,594,701 issued to Forin and further in view of U.S. patent No. 6,810,428 issued to Larsen. According to M.P.E.P. §2143, to establish a prima facie case of obviousness, three criteria must be met. First, there must be some teaching, suggestion, or motivation known to those skilled in the art to combine or modify the references. Second, there must be a reasonable expectation of success. Third, the prior art combination of references must teach or suggest all the claim limitations. The Examiner has not established that any criteria for a prima facie case of obviousness has been met in this instance.

First, there is no objective reason provided by the Examiner to combine the Doshi, et al., Forin, and Larsen, et al. patents as proposed. The Examiner has failed to provide an objective reason that would have prompted a person of ordinary skill in the art to combine the Doshi, et al., Forin, and Larsen, et al. patents. The Doshi, et al. patent is directed to a data services retransmission procedure. The Forin patent is directed to controlling data flow using credits. The Larsen, et al. patent is directed to multi-station communication and operation. Thus, the three cited patents apply to different areas of technology. The Examiner has not cited any objective reason showing any capability for them to be combined. The Examiner merely states that one of ordinary skill in the art would be motivated to provide the feature of the claimed invention, presumably taught by the Larsen, et al. patent, and the feature of the Forin patent in the Doshi, et al. patent. The rationale provided by the Examiner for their combination is purely subjective conjecture and speculation with no objective reasoning being provided to

support combining the references as has been proposed. The Examiner is merely taking bits and pieces of unrelated subject matter in an improper hindsight attempt at reconstructing the claimed invention.

The Examiner merely provides a baseless and subjective conclusory "it would have been obvious to combine" statement using improper hindsight reconstruction without any support for such conclusory statements from the point of view of those skilled in the art. Moreover, the Examiner provides a motivation to modify the cited art that is purely generic and not justified anywhere in the cited art. A statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See M.P.E.P. 2143.01. Since the Examiner has used the claim language in a hindsight attempt to support the combination of the references and has not provided any proper reasoning, let alone objective reasoning for the combination of the Doshi, et al., Forin, and Larsen, et al. patents, the burden to establish the first criteria of a prima facie case of obviousness has not been met.

Second, a reasonable expectation of success has not been shown by the Examiner. The combination of the Doshi, et al., Forin, and Larsen, et al. patents would not be capable of performing the operation required by the claimed invention. There is no showing by the Examiner that the functions of any of the Doshi, et al., Forin, and Larsen, et al. patents would be able to operate in a single system. There has also been no

showing that the combined references would even be able to perform the functionality of the claimed invention. The proposed combination attempts to combine incompatible processing techniques that have not been shown to be capable of operating according to any degree of predictability. The Doshi, et al., Forin, and Larsen, et al. patents are addressing different problems. The Doshi, et al. patent of retransmitting invalid packets provides a completely different operation than the credit-based data flow control of the Forin patent and the multi-station communication technique provided in the Larsen, et al. patent. The Examiner, without the improper hindsight look through the claimed invention, has not addressed how the proposed combination of the cited references would have any success whatsoever let alone a reasonable expectation of success. Therefore, Applicant respectfully submits that the Examiner has failed to establish the second criteria for a prima facie case of obviousness.

Third, the Examiner has not shown that the proposed Doshi, et al. - Forin - Larsen, et al. combination teaches or suggests all of the claim limitations. With respect to Independent Claims 1 and 6, there is recited in general an ability to send a first data packet of a particular packet flow over a first one of a plurality of channels selected according to the channel capacities of the plurality of channels and send a second data packet in the particular packet flow over a second one of the plurality of channels, different from the first one of the plurality of channels, as a result of the varying capacities of the plurality of channels. By contrast, the Doshi, et al. patent discloses only a single communication path 121 for transmission of packets. The Doshi, et al. patent merely discloses that the single communication path 121 may be a tandem transmit path

121 and receive path 122. Accordingly, the Doshi, et al. patent only supports the capability of having intermediate packet switches interconnected by data links along communication path 121 and in tandem along communication path 122. Thus, there is no disclosure in the Doshi, et al. patent that supports a capability to send a data packet over a selected one of a plurality of channels and send a subsequent data packet over a different one of the plurality of channels as required in the claimed invention.

The Examiner readily admits that the Doshi, et al. patent fails to disclose an ability to generate data packets in packet flows in response to flow control credits. To offset the deficiencies of the Doshi, et al. patent, the Examiner cites the Forin patent. However, the Forin patent discloses constructing packets having sizes based on credits but does not include any additional material related to selecting from a plurality of channels for packet transport found lacking in the Doshi, et al. patent.

The Examiner readily admits that the proposed Doshi, et al. - Forin combination fails to disclose an ability to select a first one of a plurality of channels to transfer the first data packet according to channel capacities of the plurality of channels, transfer the first data packet over the selected first one of the plurality of channels, select a second one of a plurality of channels to transfer the second data packet according to channel capacities of the plurality of channels, and transfer the second data packet of the particular packet flow over the selected second one of the plurality of channels wherein the second one of the plurality of channels is different than the first one of the plurality of channels as a result of varying channel capacities among the plurality of channels. The Examiner attempts to overcome the deficiencies

of the Doshi, et al. and Forin patents by citing the Larsen, et al. patent in combination therewith. However, the Larsen, et al. patent merely discloses selecting a data channel that is free of activity to allow one station to communicate to another station. There is no disclosure in the Larsen, et al. patent that allows a second packet in a particular packet flow to be sent on a different one of the plurality of channels than a first data packet of the particular packet flow. The disclosure of the Larsen, et al. patent only knows that it can send out data on a data channel selected based on its availability. The Larsen, et al. patent explicitly discloses that a data channel is selected and communication continues on that data channel until all data has been transferred or the data timer for the data channel expires. (See col. 7, lines 1-8, of the Larsen, et al. patent). As a result, there is no disclosure in the Larsen, et al. patent that different channels can be selected on a packet by packet basis. Thus, the portion of the Larsen, et al. patent cited by the Examiner fails to disclose any capability to send a first packet of a particular packet flow on a first one of a plurality of channels and a second packet of the particular packet flow on a different one of the plurality channels as required by the claimed invention.

With respect to Independent Claim 11, there is recited in general the ability to receive a plurality of data packets in a non-sequential order over different ones of a plurality of channels. By contrast, as noted above, the Doshi, et al. patent receives all packets over the same communication path 121. Moreover, the Doshi, et al. patent transmits packets out in a sequential order for receipt over the communication path 121. Because all packets are transmitted over the same path, the receiver of the Doshi, et al. patent receives packets in

sequential order but only stores those packets that are valid in its buffer. Invalid packets would need to be retransmitted. Thus, the Doshi, et al. patent is not able to receive packets in a non-sequential order transmitted over a plurality of channels as required by the claimed invention. Moreover, as noted above, the Forin patent does not include any additional material to offset the deficiencies of the Doshi, et al. patent. As discussed above, the Larsen, et al. patent has no disclosure that data packets for a particular packet flow can be received over different virtual channels. Thus, the Larsen, et al. patent is not capable of receiving a plurality of data packets of a particular packet flow in a non-sequential order over different ones of a plurality of channels as provided in the claimed invention.

Based on the above deficiencies in the prior art cited by the Examiner, Applicant respectfully submits that Claims 1-14 are patentably distinct from the proposed Doshi, et al. - Forin - Larsen, et al. combination.



3. Claims 15-18 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 5,222,061 issued to Doshi, et al. in view of U.S. Patent No. 6,944,173 issued to Jones, et al. According to M.P.E.P. §2143, to establish a prima facie case of obviousness, three criteria must be met. First, there must be some teaching, suggestion, or motivation known to those skilled in the art to combine or modify the references. Second, there must be a reasonable expectation of success. Third, the prior art combination of references must teach or suggest all the claim limitations. The Examiner has not established that any criteria for a prima facie case of obviousness has been met in this instance.

First, there is no objective reason provided by the Examiner to combine the Doshi, et al. and Jones, et al. patents as proposed. The Examiner has failed to provide an objective reason that would have prompted a person of ordinary skill in the art to combine the Doshi, et al. and Jones, et al. patents. The Doshi, et al. patent is directed to a data services retransmission procedure. The Jones, et al. patent is directed to virtual channel flow control credits. Thus, the cited patents apply to different areas of technology. The Examiner has not cited any objective reason showing any capability for them to be combined. The Examiner merely states that one of ordinary skill in the art would be motivated to provide the feature of the claimed invention, presumably taught by the Jones, et al. patent in the Doshi, et al. patent. The rationale provided by the Examiner for their combination is purely subjective conjecture and speculation with no objective reasoning being provided to support combining the references as has been proposed. The Examiner is merely taking bits and pieces of unrelated subject matter

in an improper hindsight attempt at reconstructing the claimed invention.

The Examiner merely provides a baseless and subjective conclusory "it would have been obvious to combine" statement using improper hindsight reconstruction without any support for such conclusory statements from the point of view of those skilled in the art. Moreover, the Examiner provides a motivation to modify the cited art that is purely generic and not justified anywhere in the cited art. A statement that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. See M.P.E.P. 2143.01. Since the Examiner has used the claim language in a hindsight attempt to support the combination of the references and has not provided any proper reasoning, let alone objective reasoning for the combination of the Doshi, et al. and Jones, et al. patents, the burden to establish the first criteria of a prima facie case of obviousness has not been met.

Second, a reasonable expectation of success has not been shown by the Examiner. The combination of the Doshi, et al. and Jones, et al. patents would not be capable of performing the operation required by the claimed invention. There is no showing by the Examiner that the functions of any of the Doshi, et al. and Jones, et al. patents would be able to operate in a single system. There has also been no showing that the combined references would even be able to perform the functionality of the claimed invention. The proposed

combination attempts to combine incompatible processing techniques that have not been shown to be capable of operating according to any degree of predictability. The Doshi, et al. and Jones, et al. patents are addressing different problems. The Doshi, et al. patent of retransmitting invalid packets provides a completely different operation than the channel flow control credit technique of the Jones, et al. patent. The Examiner, without the improper hindsight look through the claimed invention, has not addressed how the proposed combination of the cited references would have any success whatsoever let alone a reasonable expectation of success. Therefore, Applicant respectfully submits that the Examiner has failed to establish the second criteria for a prima facie case of obviousness.

Third, the Examiner has not shown that the proposed Doshi, et al. - Jones, et al. combination teaches or suggests all of the claim limitations. With respect to Independent Claim 15, there is recited in general the ability to receive a plurality of data packets of a particular packet flow in a non-sequential order over different ones of a plurality of channels. By contrast, as noted above, the Doshi, et al. patent receives all packets over the same communication path 121. Moreover, the Doshi, et al. patent transmits packets out in a sequential order for receipt over the same communication path 121. Because all packets are transmitted over the same path, the receiver of the Doshi, et al. patent receives packets in sequential order but only stores those packets that are valid in its buffer. Invalid packets would need to be retransmitted. Retransmitted packets would then be stored at the end of the string of packets and assigned a sequential transmit order number. Thus, the Doshi, et al. patent is not able to receive packets in a non-sequential order transmitted

over a plurality of channels as required by the claimed invention. The Jones, et al. patent has no disclosure that data packets for a particular packet flow can be received over different virtual channels. The Jones, et al. patent only receives packets associated with a particular VCN over that VCN when a credit has been issued. Packets received over that VCN are stored in a buffer specifically assigned to that VCN. (See col. 3, lines 42-66, of the Jones, et al. patent). Similarly, on the transmit side, a specific transmit buffer is associated with that VCN. (See col. 4, lines 10-15, of the Jones, et al. patent). As a result, the Jones, et al. patent is only capable of sending packets over a particular VCN from a specific transmit buffer to a specific receive buffer associated with the particular VCN in response to a credit for the particular VCN. All of the data associated with a virtual channel credit is sent over the same designated virtual channel. The Jones, et al. patent merely discloses sending all of the data associated with a virtual channel credit over the same designated virtual channel. If the designated channel is not ready for data transmission, then the Jones, et al. patent discloses waiting until the designated channel is ready. See col. 4, lines 8-15, of the Jones, et al. patent. Thus, the Jones, et al. patent is not capable of receiving a plurality of data packets of a particular packet flow in a non-sequential order over different ones of a plurality of channels as provided in the claimed invention. Therefore, Applicant respectfully submits that Claims 15-18 are patentably distinct from the proposed Doshi, et al., - Jones, et al. combination.

CONCLUSION

Applicant has clearly demonstrated that the present invention as claimed is clearly distinguishable over all the art cited of record, either alone or in combination, and satisfies all requirements under 35 U.S.C. §§101, 102, and 103, and 112. Therefore, Applicant respectfully requests the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a notice of allowance of all claims.

Please charge Deposit Account No. 02-0384 of BAKER BOTTS L.L.P. an amount of \$510.00 to satisfy the appeal brief fee of 37 C.F.R. §41.20(b)(2).

The Commissioner is hereby authorized to charge any fees or credit any overpayments associated with this Application to Deposit Account No. 02-0384 of BAKER BOTTS L.L.P.

Respectfully submitted,

BAKER BOTTS L.L.P.

Attorneys for Applicant



Charles S. Fish

Reg. No. 35,870

May 7, 2008

Correspondence Address:

2001 Ross Avenue, Suite 600

Dallas, TX 75201-2980

(214) 953-6507

Customer Number: 05073

APPENDIX A

1. (Previously Presented) A method for ordering data transferred over multiple channels, comprising:

generating a first data packet in a particular packet flow in response to a first flow control credit;

generating a first sequence number;

inserting the first sequence number into the first data packet;

selecting a first one of a plurality of channels to transfer the first data packet according to channel capacities of the plurality of channels;

transferring the first data packet over the selected first one of the plurality of channels;

generating a second data packet in the particular packet flow in response to a second flow control credit;

generating a second sequence number;

inserting the second sequence number into the second data packet;

selecting a second one of a plurality of channels to transfer the second data packet according to channel capacities of the plurality of channels;

transferring the second data packet of the particular packet flow over the selected second one of the plurality of channels, the second one of the plurality of channels being different than the first one of the plurality of channels as a result of varying channel capacities among the plurality of channels.

2. (Previously Presented) The method of Claim 1, further comprising:

incrementing the sequence number in response to transfer of the first data packet.

3. (Previously Presented) The method of Claim 1, further comprising:

decrementing a number of flow control credits in response to transfer of the first data packet.

4. (Original) The method of Claim 3, further comprising:  
receiving a reply, the reply including a flow control credit;

incrementing a number of flow control credits in response to receipt of the reply.

5. (Original) The method of Claim 1, further comprising:  
resetting the sequence number to an initial value.

6. (Previously Presented) A system for ordering data transferred over multiple channels, comprising:

a sequence number unit operable to generate a first sequence number;

a request channel controller operable to receive a first data packet of a particular packet flow in response to a first flow control credit, the request channel controller operable to insert the first sequence number into the first data packet, the request channel controller operable to select a first one of a plurality of request channels according to channel capacities of the plurality of request channels, the request channel controller operable to transfer the first data packet over the selected first one of the plurality of request channels, the request channel controller operable to receive a second data packet in the particular packet flow in response to a second flow control credit, the request channel controller operable to insert a second sequence number into the second data packet, the request channel controller operable to select a second one of the plurality of request channels according to channel capacities of the plurality of request channels, the request channel controller operable to transfer the second data packet over the selected second one of the plurality of request channels, the second one of the plurality of channels being different than the first one of the plurality of channels as a result of varying channel capacities among the plurality of channels.

7. (Original) The system of Claim 6, wherein the request channel controller is operable to generate an increment signal, the sequence number unit operable to advance the sequence number in response to the increment signal.



8. (Original) The system of Claim 6, further comprising:  
a credit counter unit operable to maintain a number of  
flow control credits.

9. (Original) The system of Claim 8, wherein the request  
channel controller is operable to generate a decrement signal,  
the credit counter unit operable to reduce the number of flow  
control credits in response to the decrement signal.

10. (Original) The system of Claim 8, wherein the credit  
counter unit is operable to increment the number of flow  
control credits in response to receipt of a reply including a  
flow control credit.

11. (Previously Presented) A method for ordering data  
transferred over multiple channels, comprising:

receiving a plurality of data packets of a particular  
packet flow over different ones of a plurality of channels,  
each data packet including a sequence number, the plurality of  
packets being received in a non-sequential order;

storing each of the plurality of data packets in a buffer  
according to its sequence number;

reading the plurality of data packets in sequential order  
from the buffer according to the sequence numbers;

generating a flow control credit in response to each of  
the plurality of data packets being read from the buffer.

12. (Original) The method of Claim 11, further comprising:

setting a valid bit in response to a data packet being stored in a portion of the buffer associated with the valid bit.

13. (Original) The method of Claim 12, further comprising:

reading a data packet from the buffer in response to the valid bit;

clearing the valid bit in response to a data packet being read from the associated portion of the buffer.

14. (Original) The method of Claim 11, wherein the sequence number is used to directly index into the buffer.

15. (Previously Presented) A system for ordering data transferred over multiple channels, comprising:

a write port controller operable to receive a plurality of data packets of a particular packet flow in a non-sequential order over different ones of a plurality of channels, each data packet including a sequence number;

a re-order buffer operable to store the plurality of data packets, the write port controller operable to place each data packet into the re-order buffer in response to its sequence number;

a valid bit unit operable to generate a valid bit for each portion of the re-order buffer, the valid bit unit operable to set a valid bit for a corresponding portion of the re-order buffer in response to a data packet being stored therein;

a read port controller operable to provide data packets in a sequential order in response to a valid bit being set.

16. (Original) The system of Claim 15, wherein the read port controller is operable to generate a flow control credit in response to providing a data packet from the re-order buffer.

17. (Original) The system of Claim 15, wherein the read port controller is operable to clear the valid bit upon providing a data packet from the re-order buffer.

18. (Original) The system of Claim 15, wherein the write port controller uses the sequence numbers to directly index the re-order buffer.

ATTORNEY DOCKET NO.  
062986.0214  
(1151.00)

PATENT APPLICATION  
09/910,587

28

EVIDENCE APPENDIX

None

ATTORNEY DOCKET NO.  
062986.0214  
(1151.00)

PATENT APPLICATION  
09/910,587

29

RELATED PROCEEDINGS APPENDIX

None

ATTORNEY DOCKET NO.  
062986.0214  
(1151.00)

PATENT APPLICATION  
09/910,587

30

CERTIFICATE OF SERVICE

None